

FIG. 1 (PRIOR ART)

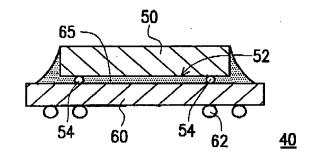


FIG. 2 (PRIOR ART)

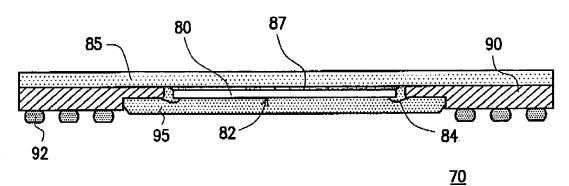


FIG. 3 (PRIOR ART)

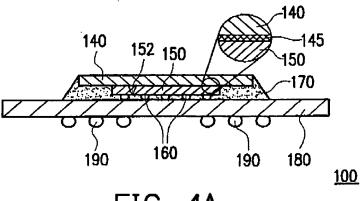


FIG. 4A

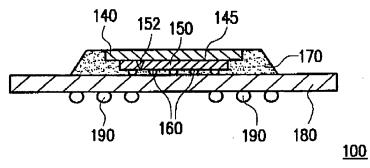


FIG. 4B

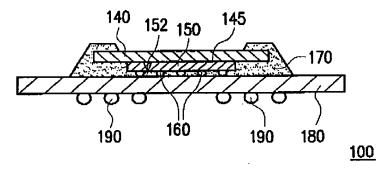


FIG. 4C

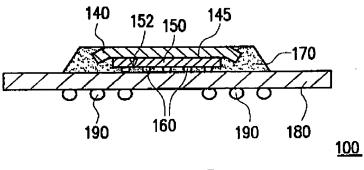


FIG. 4D

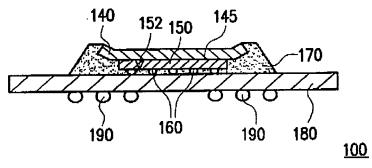
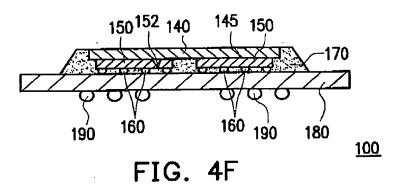


FIG. 4E



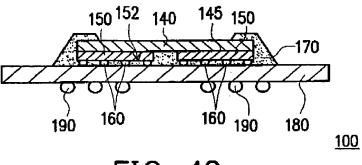


FIG. 4G

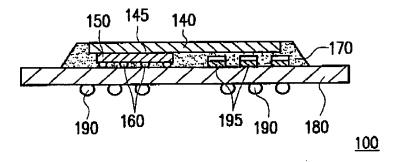


FIG. 4H

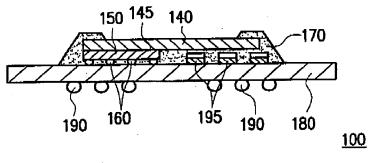


FIG. 141

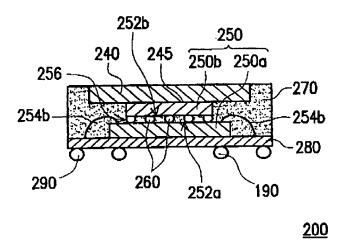


FIG. 5

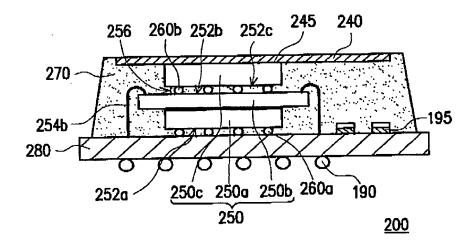
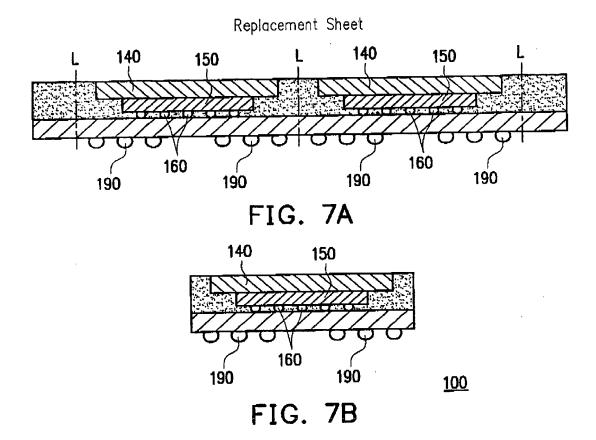
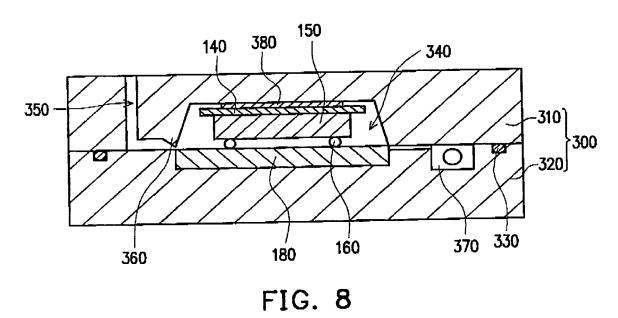


FIG. 6





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	Example 1	Contrast	Contrast	Example 2	Example 3	Example #	Example
	•	example 1	example 2				2
Matallia curfoce fluch	Ç	OK.	OK	OK	OK	OK	OK.
INICIALLO SILLACO LIUSE	100%	100%	15%	99%	97%	100%	100%
Hip-chip bonding gap ming capacity 2	100/0	100,0	47		0	>	>
Solder persistence *3	•	0	×	C		2000	2000 000126
Temperature recycle reliability *4	2000 cycles	500 cycles	1	2000 cycles	2000 cycles 2000 cycles 2000 cycles	Zuud cycles	7000 CACTES
I dillocature recognistic recognistics	Son hours	168 hours	:	>500 hours	>500hour	>500 hours	>500 hours
PC1 Renability To	CTROTT OOC	Too Home					Ġ
Others							
	Contrast	Contrast	Example 6	Example 7	Example 8	Contrast	Contrast
	دب	4				example 5	example b
Martin San Angh		0%	OK	OK	OK	Maximum	OK.
Metallic surface masir	C	}				2mm	
filing this bonding can filling canacity *2	40%	30%	100%	100%	100%	100%	100%
Lib-cmb control gab mang salesses	×	×	>	•	>	•	
	4		7000 22122	JOOO goodes	2000 cycles	2000 cycles	ı
Temperature recycle reliability *4	ı	1	2000 cycles	2000 Cycles	ECO CJOICO	> 600 barrer	
PCT Reliability *5	;		>500 hours	>500 hours	Smou noc<	STHOM POCK	
Others							

^{*2} relative to chip area, material filling area ratio (filling capacity) average value using SAT criteria

*4 temperature recycle reliability: gaseous surrounding, 65°C/15min ~ 150°C/15min

^{*3} solder persistence: ▲: JEDEC level II passed; O: JEDEC level III passed; (n = 11) X: JEDEC level III failed

^{*5} PCT reliability 121°C/2atms

assessed using a total of 32 molded devices, 2 defective devices/remaining non-defective devices